

WAVELENGTH DIVISION AND POLARIZATION DIVISION MULTIPLE  
ACCESS FREE SPACE OPTICAL TERMINAL USING A SINGLE APERTURE

ABSTRACT OF THE DISCLOSURE

A communication device uses one or two stacks of reflective deflectors to steer  
5 the electromagnetic waves carrying signals received and transmitted through a single  
telescope/aperture device. The signals outside the device may be circularly polarized  
while inside the device they are linearly polarized most of the time. The deflectors  
within each stack are transparent to the signals steered by the deflectors behind them.  
Since the deflecting wave band may shift with the changing angle of incidence of the  
10 signals due to steering, the wave bands are sufficiently spaced apart. When the signals  
impact the deflectors at nearly normal angles, the wave bands can be made more  
narrow. When more than one stack of deflectors is used, the spacing between the wave  
bands within one stack may be utilized by another stack. Beam splitters and a variety of  
other optical devices (such as quarter wave plates, half wave plates, Faraday rotators,  
15 and equivalent devices) are used to separate signals for further processing within the  
device. Instead of reflective deflectors, the device may generally use stacks of  
transmissive deflectors for similar effect in a similar way.